

REMARKS

Claims 1, 2, 4-9, 11-14 and 21-26 are pending. Claim 23 is amended as supported at page 6, last paragraph.

New Claim 25 recites the cathode plate is flexed to remove the deposited metal. It is respectfully submitted this is supported by the description of PCT/FI99/00979 at the paragraph bridging pages 2 and 3.

Claim 26 recites the cathode is made of resilient stainless steel. It is respectfully submitted forming an envelope of metal on a stainless steel cathode is supported by the description of PCT/FI99/00979 at page 2, next to last paragraph. Since the cathode is flexed it is resilient.

It is respectfully submitted these features are aspects of PCT/FI99/00979 carried over into embodiments of the present invention. The present invention improves upon PCT/FI99/00979. This follows from Figure 3 of the present application, described at page 4, which shows a bottom edge of a cathode of PCT/FI99/00979. Then page 6 explains how the present invention solves a problem with the embodiment of Figure 3 by tailoring the size and shape of the groove. Thus, other aspects of PCT/FI99/00979, such as flexing and a species of cathode material, are also employed in embodiments of the present invention.

PCT/FI99/00979 published as WO 00/32846, was cited in an IDS of December 14, 2001, and names one of the present inventors, David Bailey, as a co-inventor. Applicants note the present application claims priority from Australian Provisional Patent Application No. PQ 1066 filed June 18, 1999, which is prior to the June 8, 2000 publication of WO 00/32846.

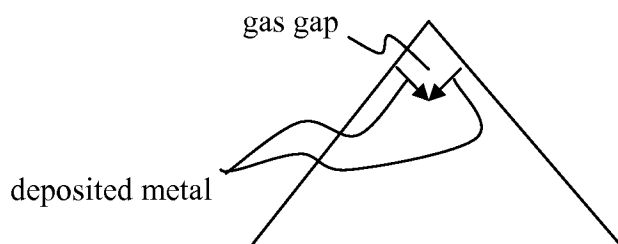
I. 35 USC 112, first paragraph

Claims 21-24 are rejected under 35 USC 112, first paragraph as failing to comply with the enablement requirement.

The Office action asserts “The applicants instant specification does not give any examples or indications of how the gas is trapped in a frangible portion and how the size and shape of the groove are used to define a line of weakness in the metal deposited within the groove based on the gas trapped.” It is respectfully submitted Claim 21 does not say the gas is trapped in a frangible portion. It says the gas is trapped in the V-shaped groove as supported by the disclosure at page 10 of the application mentioned in the Office action. The size and shape

are selected by selecting the angle to accomplish the goal. Contrary to the statement in the Office action, pages 8 and 9 indicate how the gas is trapped in a frangible portion and how the size and shape of the groove are used to define a point of weakness.

Page 9 explains the angle is selected to preferably allow deposition of copper in the V-groove adjacent the apex with the line of weakness extending between the arc of the V-groove 150 and gives examples of suitable angles. Page 9 explains applicants have found that certain groove sizes and shapes permit such 'symmetrical' splitting of the deposited metal while others do not and gives a groove having an arc of 90 degrees plus or minus 15 degrees as suitable. The bottom of page 8 explains the copper crystals are deposited at right angles. Thus, selecting a proper V-groove angle causes the crystals to form without filling adjacent the apex of the V-groove with copper. Also, since gas rises from below the cathode plate during deposition of metal, as mentioned in claim 14, the gas is trapped in the apex of the groove.



Thus, the gas is trapped in the apex of the groove behind the metal.

It is respectfully submitted the small amount of gas at the apex does not conflict with amended Claim 23.

II. 35 USC § 103(a)

Claims 1, 2, 4-9, and 11-14 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over CA 910844. The Office Action asserts the reference teaches or suggests each feature of the claims.

A. CA '844 does not disclose the presently recited angle

The Office action indicates applicant cannot take the angle shown in the drawing as literal yet it further states that the drawing appears to fall within the range of the present application. This is clearly not correct.

The Office action with no basis states the angles of the V-groove of the patented invention of CA '844 must be within the range set forth by the Applicant's instant invention for the copper sheets to have a line of weakness within the V-groove.

The plane of weakness defined by the patented invention of CA '844 is not described as being within the V-groove. It simply states a plane of weakness is provided. Further, it is stated several times in the cited document that the copper is deposited at the edge of the cathode plate rather than in the V-groove. Thus, Applicant requests the Examiner show where CA '844 discloses the "plane of weakness" being inside the V-groove. There is a disclosure of copper in the form of dendrites developing in directions normal to the sides of the V-groove but this could equally require the plane of weakness to be formed entirely outside the groove. In fact, such an arrangement would satisfy the previously mentioned description of copper being deposited at the edge.

Further, this arrangement is consistent with the experimental and testing data obtained by the Applicant when developing the present invention. As discussed earlier, with the narrow V-groove of the patented invention of CA '844 there is not sufficient copper formed within the V-groove. Rather, the preferential failure point is at the thinnest deposit i.e. the two outside edges of the V-groove. This is shown in the prior art drawing Fig. 3 of the present application and is consistent with both the experimental and testing data obtained by the Applicant and the previously filed Rule 132 Declaration.

In regard to the above and the "plane of weakness" Applicant also refers to claim 3 of CA '844 which defines the "inverted V-shaped groove in the bottom peripheral edge" and then further states the plane of weakness is formed in the copper "deposited at this edge. In other words the plane of weakness is not within the V-groove but rather is at the peripheral edge of the cathode blank of the citation. This applies to the narrow V-groove of the citation rather than the relatively wide groove of the present application.

B. Rule 132 Declaration

The previously filed Declaration by one of the inventors discusses the criticality of the angle ray of the V-groove. For example, as explained in paragraph 8 of the Declaration, the $90^{\circ} \pm 15^{\circ}$ was determined on the basis for "the need for the span of the V-groove to be large enough for copper to be deposited in the groove and thereby produce fracture or crack initiation within the group (as opposed to on the outside of the group) but not so large that it completely fills with deposited materials to such an extent that the material cannot be released cleanly."

As explained in paragraph 9 of the Declaration, "the approximate 50° span of the prior art in CA 910,844, as shown in Fig.3 thereof, does not provide for clean release the deposited metal from the cathode."

Thus, CA '844 does not teach or suggest limiting the angle of the V-groove as presently claimed.

C. Dependent Claims Further Distinguish Over CA '844

New dependent Claims 25 and 26 raise new issues.

New dependent Claim 25 recites flexing the cathode plate. Thus, the plate is produced from a resilient metal. This is absent from the Canadian document. The Canadian patent refers to relatively rigid plate-like reusable cathode blanks. The cathode blanks of the present application used with the ISA process are in fact quite resilient and the stripping operation is initiated by flexing the cathode plate and deposited copper by application of a suitable force as described in the specification.

CA '844 refers to stripping the deposits from the cathode by knives inserted along the upper edge of the deposit. There is no mention of flexing or the resilient nature of the cathode. Indeed, in one embodiment relating to electro winning, the citation confirms that there is "some mechanical deformation of the sheet" but that the "thin cathode starting sheet is straightened by manual or mechanical means" for later reuse.

New dependent Claim 26 recites the cathode is made of resilient stainless steel. It is respectfully submitted CA '844 does not disclose this.

Claims 2 and 9 recite the line of weakness is formed within the arc of the V. There is no teaching or suggestion of such a feature in the reference. Since, as shown by Figure 3, the angle of the V determines the location of the line of weakness, it cannot be said that such a feature is

inherent, i.e., necessarily present, in the cited reference. Thus, Applicants respectfully submit claims 2 and 9 are allowable over CA '844.

Claims 5 and 12 recite “wherein the groove is shaped to allow deposition of metal directly adjacent the apex of the groove.” While the reference teaches that the deposition occurs “in directions normal to the sides of the V-groove” (page 7, lines 14-15), it is not necessarily so, i.e., inherent, that the deposition occurs “directly adjacent to the apex of the groove.” As shown by Figure 3 of the present specification, depending upon the angle of the V-groove, such a feature may be impossible. Accordingly, Applicants respectfully submit claims 5 and 12 are allowable over the cited references.

Claims 7 and 14 recite “wherein the groove is shaped to capture gas rising from below the cathode plate during deposition of metal.” Again, there is no teaching or suggestion of such a feature in the reference. Since, as shown by Figures 3-6, the angle of the V determines the location of the line of weakness, it cannot be said that such a feature is inherent, i.e., necessarily present, in the cited reference. Thus, Applicants respectfully submit claims 7 and 14 are allowable over CA '844.

D. Claims 21-24 Further Distinguish Over CA '844

Claim 21 and its dependent claims further distinguish the present invention from the invention of CA '844. Specifically, Claim 21 recites, *inter alia*, a step of trapping gas in V-groove to define the location of the frangible portion. By directing the location of the trapped gas, the location of the frangible portion where the deposited metal will fracture can be more accurately controlled. This permits more reliability in the symmetrical nature of the resulting sheets. As CA '855 neither teaches nor suggests such a step, Applicants respectfully present Claim 21 is allowable over the cited references.

III. Conclusion

In view of the above, it is respectfully submitted the present claims are neither taught nor suggested by the cited references and the present invention is novel and inventive over the cited document. A Notice of Allowance is respectfully requested.

If any fee is necessary to make this paper, or any paper filed herewith, timely and/or complete, such fee may be deducted from deposit account number 19-4375.

Respectfully submitted,

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Date: October 31, 2007

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